



**University of  
Zurich**<sup>UZH</sup>

**Zurich Open Repository and  
Archive**

University of Zurich  
University Library  
Strickhofstrasse 39  
CH-8057 Zurich  
[www.zora.uzh.ch](http://www.zora.uzh.ch)

---

Year: 2016

---

**Molecular Markers for the Prediction of Minor Response to Neoadjuvant  
Chemoradiation in Esophageal Cancer: Results of the Prospective Cologne  
Esophageal Response Prediction (CERP) Study**

Bollschweiler, Elfriede ; Hölscher, Arnulf H ; Herbold, Till ; Metzger, Ralf ; Alakus, Hakan ; Schmidt,  
Henner ; Drebber, Uta ; Warnecke-Eberz, Ute

DOI: <https://doi.org/10.1097/SLA.0000000000001911>

Posted at the Zurich Open Repository and Archive, University of Zurich

ZORA URL: <https://doi.org/10.5167/uzh-135136>

Journal Article

Published Version

Originally published at:

Bollschweiler, Elfriede; Hölscher, Arnulf H; Herbold, Till; Metzger, Ralf; Alakus, Hakan; Schmidt, Henner; Drebber, Uta; Warnecke-Eberz, Ute (2016). Molecular Markers for the Prediction of Minor Response to Neoadjuvant Chemoradiation in Esophageal Cancer: Results of the Prospective Cologne Esophageal Response Prediction (CERP) Study. *Annals of Surgery*, 264(5):839-846.

DOI: <https://doi.org/10.1097/SLA.0000000000001911>

# Molecular Markers for the Prediction of Minor Response to Neoadjuvant Chemoradiation in Esophageal Cancer: Results of the Prospective Cologne Esophageal Response Prediction (CERP) Study

Bollschweiler, Elfriede MD, PhD; Hölscher, Arnulf H. MD; Herbold, Till MD; Metzger, Ralf MD; Alakus, Hakan MD; Schmidt, Henner MD; Drebber, Uta MD; Warnecke-Eberz, Ute MD

## Annals of Surgery:

November 2016 - Volume 264 - Issue 5 - p 839–846 ([/annalsofsurgery/toc/2016/11000](http://annalsofsurgery.com/toc/2016/11000))

doi: 10.1097/SLA.0000000000001911

ESA Papers

## Abstract

**Objective:** The aim of this study was to evaluate the predictive value of a single or combination of biomarker(s) for histopathologic non-response to neoadjuvant chemoradiation in esophageal cancer.

**Summary of Background Data:** Patients without response to neoadjuvant chemoradiation for esophageal cancer have no prognostic benefits, but experience time delays and risk side effects.

**Methods:** Inclusion criteria for this prospective diagnostic study were patients with cT3,Nx,M0, esophageal squamous cell or adenocarcinoma and planned neoadjuvant chemoradiation (5- fluorouracil, cisplatin, 40Gy) followed by 2-field transthoracic esophagectomy. From pretherapeutic endoscopic tumor biopsies, ERCC1 rs11615 single-nucleotide polymorphism (ERCC1-SNP) and a combination of gene expression marker mRNA (ERCC1, DPYD, ERBB2) were analyzed. ERCC1-SNP was subdivided into homozygous C-allele (CC) and T-allele (TT), and heterozygous C/T carriers. The primary endpoint was the prediction of histopathological minor response ( $\geq 10\%$  vital tumor cells in the primary tumor) relative to marker levels.

**Results:** From 2009 until 2013, 320 patients were screened, and 85 patients (SCC n = 29, AC n = 56) were included in the study. Forty-one patients (48%) had major response with 3-year survival rate (3-YSR) of 57% compared with 44 patients with minor response and 3-YSR of 25% ( $P = 0.001$ ). Patients with ERCC1-SNP CC (n = 8) and TT (n = 37) had similar rates of minor response of 70% and 75%, and a positive predictive value (PPV) of 71% [95% confidence interval (CI) 56%–84%]. PPV increased to 89% (95% CI 73%–96%) when ERCC1-SNP was combined with mRNA markers.

**Conclusion:** ERCC1-SNP in combination with mRNA ERCC1, DPYD, and ERBB2 from pretherapeutic endoscopic biopsies can predict minor response to chemoradiation, as a basis for individualized therapy of advanced esophageal cancer.

## Author Information

Department of General, Visceral and Cancer Surgery, University Hospital of Cologne, Institute of Pathology, University Hospital of Cologne, Cologne, Germany.

Reprints: Elfriede Bollschweiler, MD, PhD, Lindauer Straße 63, 50935 Cologne, Germany. E-mail:

ebollsch@uni-koeln.de (mailto:ebollsch@uni-koeln.de).

Prospective Diagnostic Study (NCT00628368).

The authors declare that they have nothing to disclose.

The authors report no conflicts of interest.

Copyright © 2016 Wolters Kluwer Health, Inc. All rights reserved.